



PHENOL

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Agency for Toxic Substances and Disease Registry ToxFAQs

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This fact sheet answers the most frequently asked health questions (FAQs) about phenol. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Phenol is a manufactured substance found in a number of consumer products. Skin exposure to high levels of phenol has resulted in liver damage, diarrhea, dark urine, and hemolytic anemia. Phenol has been found in at least 481 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is phenol?

(Pronounced fē' nôl')

Phenol is a manufactured substance. It is a colorless-to-white solid when pure. The commercial product is a liquid. It has sickeningly sweet and tarry odor.

You can taste and smell it at levels lower than those that are associated with harmful effects. Phenol evaporates more slowly than water, and a moderate amount can form a solution with water. Phenol can catch fire.

Phenol is used primarily in the formation of phenolic resins. It is also used in the manufacture of nylon and other synthetic fibers. It is also used in slimicides (chemicals that kill bacteria and fungi in slimes), as a disinfectant, as an anti-septic, and in medicinal preparations, such as mouthwash and sore throat lozenges.

What happens to phenol when it enters the environment?

- ☐ Following small, single releases, phenol does not remain in the air long (generally, half is removed from the air in less than a day).
- ☐ It generally remains in the soil only about 2 to 5 days.

- ☐ It can remain in water for longer than 9 days.
- ☐ Larger or repeated releases can remain in the air, water and soil for much longer periods of time.
- ☐ Small amounts of phenol may be found in organisms that live in contaminated water.

How might I be exposed to phenol?

- ☐ You may be exposed to phenol if you work with or manufacture it.
- ☐ You may be exposed to very low levels in your home because it is found in a number of products, including some medicines, lotions, and ointments.
- ☐ Low levels of phenol are found in some foods, including smoked summer sausage, fried chicken, mountain cheese, and some species of fish.
- ☐ Phenol enters the lungs when you inhale tobacco smoke.
- ☐ It can be present in low levels in air and drinking water.

How can phenol affect my health?

In people, the effects of breathing phenol in air are not known. People who had skin exposure to high levels had liver damage, diarrhea, dark urine, and hemolytic anemia.

In animals, breathing air with high levels of phenol re-

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sulted in irritation of the lungs. Repeated exposures led to muscle tremors and loss of coordination. Exposure to high levels of phenol for several weeks caused paralysis and severe injury to the heart, liver, kidneys, and lungs, and in some cases, death.

Phenol can have beneficial effects when used medically as an antiseptic or anesthetic.

How likely is phenol to cause cancer?

It is not known if phenol causes cancer in people. Cancer occurred in mice when phenol was applied to the skin several times each week for the lifetime of the animal. Phenol did not cause cancer in mice or rats when they drank water containing it for 2 years. The International Agency for Research on Cancer (IARC) has determined that phenol is not classifiable as to its carcinogenicity to humans.

How can phenol affect children?

Children are exposed to phenol in the same way adults are. Children are at greater risk of accidentally ingesting home products that contain phenol. The effects of exposure to phenol on the human fetus are not known. Pregnant animals that drank water containing high concentrations of phenol gave birth to babies that had low birth weights and minor birth defects.

How can families reduce the risk of exposure to phenol?

If your doctor finds that you have been exposed to high levels of phenol, ask if children may also be exposed. Your doctor may need to ask your state department of health to investigate.

Is there a medical test to show whether I've been exposed to phenol?

There is a urine test that can tell if you have been exposed to phenol recently (within 1 or 2 days). However, the test cannot tell if you were exposed only to phenol since many substances are converted to phenol in the body.

Has the federal government made recommendations to protect human health?

EPA has a lifetime health advisory for adults for phenol in drinking water of 4 milligrams per liter (4 mg/L). EPA also recommends that the level of phenol in surface water (lakes, streams) should be limited to 3.5 mg/L to protect people from drinking contaminated water or eating contaminated fish.

The Occupational Safety and Health Administration (OSHA) has set a limit of 5 parts per million (5 ppm) for workers during an 8-hour workshift in a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that workroom air be limited to 5 ppm over a 10-hour workday and that concentrations should not exceed 16 ppm during a 15-minute period.

Source of Information

Agency for Toxic Substances and Disease Registry (ATSDR). 1998. Toxicological profile for phenol. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Animal testing is sometimes necessary to find out how toxic substances might harm people and how to treat people who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-639-6359. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html> ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

